

**Section B: U.S. Department of Interior Preliminary 4(e) Conditions –
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Section B: U.S. Department of Interior Preliminary 4(e) Conditions – Reclamation Reservation

Bureau of Reclamation's Reservations

The U.S. Department of the Interior, through the Bureau of Reclamation (Reclamation) has developed conditions pursuant to Section 4 (e) of the Federal Power Act for the protection and utilization of Reclamation-administered reservations. These conditions are in support of the Klamath Reclamation Project (Reclamation Project) that uses water from the Klamath River, as well as the Lost River, to irrigate over 200,000 acres of agricultural land and provide water to two National Wildlife Refuges located wholly within the Reclamation Project's boundaries. The Reclamation-administered lands include those lands that support the diversion and drainage facilities that allow the Reclamation Project to deliver water to those agricultural lands and Refuge lands, provide for flood control and return waters previously diverted to the Klamath River. These Reclamation-administered lands are within and near the project boundaries of the Klamath Hydroelectric Project that are "reservations" as defined by the Federal Power Act.

Section 4(e) of the Federal Power Act (FPA) gives the Secretary of the Interior (Secretary) authority to impose conditions on licenses issued by the Commission for hydropower projects located on "reservations" under the Secretary's supervision. *See* 16 U.S.C. §§796(2), 797(e); *see also Escondido Mut. Water v. La Jolla Band of Mission Indians*, 466 U.S. 765 (1984). Specifically, Section 4 (e) provides:

That licenses shall be issued within any reservation only after a finding by the Commission that the license will not interfere or be inconsistent with the purpose for which such reservation was created or acquired, and shall be subject to and contain such conditions as the Secretary of the department under whose supervision such reservation falls shall deem necessary for the adequate protection and utilization of such reservations.

The Federal Power Act (FPA), 16 U.S.C. § 796(2) defines reservations as follows:

... "reservations" means national forest, tribal lands embraced within Indian reservations, military reservations, and other lands and interests in lands owned by the United States, and withdrawn, reserved, or withheld from private appropriation and disposal under the public land laws; also lands and interests in the lands acquired and held for any public purposes; but shall not include national monuments or national parks; . . .

The Reclamation Project lands within the Klamath Reclamation Project are located within the existing project boundary of the Klamath Hydroelectric Project (Project No. 2082) are shown on the enclosed map. Keno Dam and both of the power plants at Link River Dam are currently within Project No. 2082 and are within Reclamation supervised lands. PacifiCorp owns Keno Dam and both power plants located at Link River Dam. The United States owns Link River Dam, which is the primary storage and control

feature of the Klamath Reclamation Project. PacifiCorp operates Link River Dam under contract with the United States to the benefit of Project No. 2082. PacifiCorp's operation of Keno Dam, both power plants at Link River Dam and Link River Dam itself affect the operation of the Klamath Reclamation Project. PacifiCorp proposes to exclude Keno Dam and both Link River Dam power plants from its proposed new license. The Department addresses these proposed boundary changes elsewhere in this filing, and has shown that the Commission must keep Keno Dam within the project boundary of any new license.

Thus, because Keno Dam is part of Project No. 2082 and is located on Reclamation supervised lands any license for the continued operation of Project No. 2082 will therefore "be issued within [these] reservation[s]," the license will be subject to conditions that the Secretary of the Interior, acting through Reclamation "shall deem necessary for the adequate protection and utilization of [these] reservation[s]." 16 U.S.C. §797(e).

As explained in greater detail below, Project No. 2082 affects resources within these Reclamation-managed "reservations." These resources include water developed under pre-1909 water rights for Klamath Reclamation Project purposes and the ability to deliver that water to meet the Project's operational needs and legal obligations. Reclamation has developed conditions for the license that are necessary for the adequate protection and continued utilization of these reservations and the resource values for which those reservations are managed. Therefore, the conditions listed below, covering specific requirements for protection and utilization of these federal lands, shall be included in any license issued for the Klamath Hydroelectric Project.

Background

The Klamath Reclamation Project lies within two primary watersheds, the Upper Klamath Basin and the Lost River Basin. Third Annual Report of the Reclamation Service, 1903-04, 58th Congress, 3rd Session, Document No. 28, pp. 202-03. Prior to the development of the Klamath Reclamation Project, the two major watersheds were linked by a flood channel that allowed water from the Klamath River to enter the Lost River and flow to Tule Lake during high run-off conditions.¹ The two watersheds are still linked but in a manner that facilitates the use of water by the Klamath Project for domestic, irrigation, and Refuge beneficial uses,² and provides for significant quantities of return flow water to be added to the Klamath River for the generation of power and other uses downstream of Keno Dam. The Lost River is recognized as a tributary to the Klamath River as a result of Project development. Consent to Negotiate Klamath River Compact, Act of August 9, 1955, 69 Stat. 613.³ The Project is operated so that flows of the Lost River and Klamath River are completely controlled except in some flood periods. Water

¹ Klamath Project History, 1903-1912; p. 111

² Klamath Project History, 1903-1912; pp. 1-2

³ Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, pp. 12-25, February 23, 2004

is reused several times before it returns to the Klamath River. The Project was designed based on this reuse of water.⁴

Major Project features of the Klamath Reclamation Project include: Link River Dam on Link River at the head of the Klamath River which regulates the flow from Upper Klamath Lake; Lost River Diversion Dam on the Lost River in Oregon that diverts excess water to the Klamath River through the Lost River Diversion Channel; Tule Lake tunnel that conveys return flow water from Tule Lake to the Lower Klamath Lake; Clear Lake Dam and Reservoir located on the Lost River in California; and Gerber Dam and Reservoir located on Miller Creek, a tributary of the Lost River in Oregon; and Malone Diversion Dam on Lost River downstream from Clear Lake Dam.⁵ All of the facilities and works described in this section were constructed by the United States and are currently owned by the United States, except where noted otherwise.⁶

In 1902, Congress enacted 1902 Reclamation Act. Act of June 17, 1902, Ch. 1093, 32 Stat. 388. The Klamath Project was authorized under the provisions of this act in May 1905.⁷ Preliminary reconnaissance for the Klamath Project area was made by John T. Whistler in October 1903.⁸ In his report, Whistler identified some of the features that would later comprise the Klamath Project, including storage of water in Upper Klamath Lake and reclaiming Lower Klamath Lake and Tule Lake. In the following year, Whistler established gaging stations on the major streams in the Klamath Project area. Also in October 1903, H.E. Green conducted a reconnaissance study of the Klamath Project area. His report remarked on many of the same features as Whistler as well as the use of Horsefly Reservoir site and Clear Lake in the Lost River drainage for project storage.⁹

As a result of these reconnaissance studies, it was determined that further investigation was warranted. T.H. Humphreys and J.B. Lippincott conducted a number of surveys of the area to examine the feasibility of lowering or draining certain lakes and to determine whether any of the existing canals in the area could be utilized in the development of a major Reclamation project.¹⁰ It was found that Upper Klamath Lake could be used for irrigation of a large area of land of approximately 300,000 acres lying almost equally in Oregon and California.¹¹

⁴ Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, p. 13, February 23, 2004

⁵ Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, pp. 12-25, February 23, 2004; Klamath Project Map.

⁶ Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, pp. 9, 62-64, February 23, 2004

⁷ Letter from E.A. Hitchcock, Secretary of the Interior, to Director of Geological Survey, Dated May 15, 1905 (pp. 00009-00011)

⁸ Klamath Project History, 1903-1912; p. 5

⁹ Klamath Project History, 1903-1912; p. 6

¹⁰ Klamath Project History, 1903-1912; p. 8

¹¹ House Report no. 3764, January 20, 1905

Shortly thereafter, in January and February 1905, the States of Oregon and California, respectively, passed legislation ceding to the United States, to aid in the operations of irrigation and Reclamation, title to lands that would be uncovered by draining certain lakes in the Project area.¹² Under the Oregon Act, the United States was given control of Upper Klamath Lake for storage of water in aid of reclamation. Congress then authorized the Secretary of the Interior to control the levels of the various lakes and dispose of any land uncovered in the process of reclamation under the terms of the federal Reclamation Act. Act of February 9, 1905, 33 Stat. 714.

Based on the recommendations of the Board of Consulting Engineers, the Secretary formally authorized the Klamath Project on May 15, 1905.¹³ The Klamath Project was authorized by the Secretary on May 15, 1905, in accordance with the Reclamation Act of 1902 (43 U.S.C. section 372 et seq., Act of June 17, 1902, 32 Stat. 388).¹⁴ The 1902 Reclamation Act authorized the Secretary of the Interior to examine, survey, locate, and construct irrigation works for the storage, diversion, and development of waters. 1902 Reclamation Act, section 2. The projects to be authorized would be built on federal land with the actual construction and operation in the hands of the Secretary. California v. United States, 438 U.S. 645, 664, 98 S. Ct. 2985, 2995, 57 L.Ed.2d 1018 (1978).

Pursuant to this authorization and that the Secretary's determination that Reclamation Projects would benefit the basin, in 1905 Reclamation filed claims to cover all of the water not previously claimed on the upper Klamath River.¹⁵ At that time Reclamation initiated a program of acquisition of senior water rights claims and previously developed irrigation projects. Reclamation developed plans and, with the support of the Secretary of the Interior, began development of the Klamath Reclamation Project. To facilitate the appropriation of water for the Klamath Reclamation Project, in 1905 the Oregon legislature enacted that a statute that authorized the Secretary to appropriate all unappropriated water for reclamation projects under the term so the act. Act of February 22, 1905, Ch. 5, title 43, L. O. L., Section 2 (section 6588, L. O. L.) See Ex. 10008, Fourth Annual Report of the Reclamation Service, 1906, pp.306-308. That Act states in pertinent part:

Whenever the proper officers of the United States, authorized by law to construct works for the utilization of water within this State, shall file in the office of the State Engineer a written notice that the United States intends to utilize certain specified waters, the waters described in such notice and unappropriated at the time of the filing thereof shall not be subject to further appropriation under the laws of this State, but shall be deemed to have been appropriated by the United States.

¹² Klamath Project History, 1903-1912; p. 22

¹³ Letter from E.A. Hitchcock, Secretary of the Interior, to Director of Geological Survey, Dated May 15, 1905 (pp. 00009-00011)

¹⁴ As a formality, the Klamath Project authorization was approved by the President on January 5, 1911, in accordance with the Act of June 25, 1910, 36 Stat. 835.

¹⁵ Filings by T. H. Humpherys with the Oregon State Engineer, Dated May 17, 1905

The Oregon Supreme Court affirmed the right of the United States to so appropriate waters in the state in developing reclamation projects under the national Reclamation program. In Re Umatilla River, 88 Ore. 376, 168 P. 922 (1917). The United States followed the procedure under the 1905 Oregon Act and became vested with title to all of the then un-appropriated water of the Klamath River with a priority dating from the date of the notice filed in accordance with the Act.

The irrigable area of the lower project was to be 188,045 acres based on preliminary surveys in the Klamath and lower Poe Valleys. The lower project would also include about 15,000 acres of land that would be served by pumping water. Third Annual Report of the Reclamation Service, 1903-04, 58th Congress, 3rd Session, Document No. 28, pp. 204-05; Fourth Annual Report of the Reclamation Service, 1904-05, 59th Congress, 1st session, Document No. 86, p. 82. These lands extend from the upper end of the Klamath Valley, at Klamath Falls, to Keno, Oregon, and include lands on either side of the Klamath River.¹⁶ Also included are lands within Lower Klamath and Tule Lake that extend into California. The water supply for these lower lands is Upper Klamath Lake.

The water supply for the lower project was projected to be diverted from Upper Klamath Lake at the head of the Link River with a main canal being carried down either side of the valley. Various branches from the main canal would carry water to the lands in the lower project, including those in Tule Lake. Third Annual Report of the Reclamation Service, 1903-04, 58th Congress, 3rd Session, Document No. 28, pp. 207-08, and the accompanying map showing the proposed canal system.¹⁷ Other than relatively minor adjustments, the development of the Klamath Project occurred in accordance with this original design and intent.¹⁸ In general, for private lands using water for irrigation or domestic uses, the United States entered into perpetual contracts with landowners, districts or companies, or both landowners and districts, which provide for delivery of water through Klamath Project and related facilities.¹⁹

The United States also acquired the Keno Canal belonging to the Moore Brothers.²⁰ The United States purchased two small canals constructed to divert water from the west side of Link River for power and irrigation purposes.²¹ The purchase of these facilities and associated riparian and vested rights was in consideration of 205 cfs to be retained by the Moore Brothers and delivered from the Keno Canal. This 205 cfs right is now owned by PacifiCorp for power generation on Link River.

¹⁶ Klamath Project History, 1903-1912; p. 22

¹⁷ General Map of Proposed Klamath Project, 1905

¹⁸ Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, p. 32, February 23, 2004

¹⁹ Contracts with Water users and Districts, pp. 00443-003137

²⁰ Direct Testimony of Stephen R. Wee, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00040049, pp. 26-28, and Direct Testimony of Rand F. Herbert, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00040048, pp. 20-21

²¹ Klamath Project History, 1903-1912; p. 31; Direct Testimony of Stephen R. Wee, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00040049, pp. 10-13

Reclamation saw the benefit that could accrue to the project with the addition of hydroelectric power, and a number of filings were made to claim the right to produce power²² in addition to the use of the water for irrigation purposes, with the waters of the Klamath River. Before Reclamation could exercise its claim for power, Copco, now PacifiCorp, proposed to develop hydroelectric power in the canyon below Keno, Oregon. For certain considerations, Reclamation relinquished its claim on the falling water, and allowed Copco to develop the now existent power infrastructure in the Klamath Basin.

To benefit both parties, Copco proposed development of Link River Dam as a feature of the Klamath Reclamation Project. Reclamation agreed to the project, and in 1917 the parties entered into a contract for Copco to build the dam and transfer it to Reclamation. In addition to transfer of the dam, Copco was to provide electric power to Reclamation and its Project water users at a fixed rate for the term of the contract.²³ This agreement benefited both parties in providing additional firm water supply for irrigation purposes with electric power for drainage pumping, and additional water at all times for power generation, both at Link River and at the Copco 1 and 2 facilities, with a firm electric customer base to pay for development of necessary infrastructure.²⁴ In 1919, a temporary dam was constructed on Link River at the outlet of Upper Klamath Lake by Copco. In 1920, Copco initially began construction of the permanent Link River Dam at the outlet of Upper Klamath Lake. In 1921, Link River Dam was completed.²⁵

In 1951, Copco proposed development of additional facilities downstream of Keno (Big Bend No. 2, the original Project No. 2082). Reclamation through the Department of the Interior intervened in the Federal Power Commission proceedings with the current 1956 contract between PacifiCorp and Reclamation the outcome of the settlement between the parties.²⁶ This contract allows PacifiCorp to continue operation and maintenance of Link River Dam, and provides for power rates for Reclamation and its water users at rates similar to those in the 1917 contract.²⁷ The development proposed in the Big Bend No. 2 project would provide additional power for the customers in the Klamath Basin.²⁸ This contract had to be ratified by both the Oregon and California Public Utility Commissions to become effective.²⁹ The current contract, if not extended, expires April 16, 2006. The Klamath River Compact confirmed the rights of the Klamath Reclamation Project to use the water of the Klamath River, while encouraging power production and other uses of those resources. Additionally, it provided that the power produced from these resources should provide the “lowest power rates which may be reasonable for irrigation and

²² Filings by J. B. Lippincott with the Oregon State Engineer, Filed January 5, 1905 (p. 000003)

²³ Bureau of Reclamation Contract No. IIR-406, Dated February 24, 1917

²⁴ Letter from Herbert D. Newell to Klamath Chamber of Commerce, Dated November 16, 1920; Evening Herald Article, Dated January 9, 1919; Copco letter to Chamber of Commerce, Dated November 15, 1920.

²⁵ Klamath Project History, 1921; p. 42

²⁶ Letter from Secretary of Interior, Oscar L. Chapman, Dated October 10, 1951; Copco letter October 26, 1951.

²⁷ Bureau of Reclamation Contract No. 14-06-200-5075, Dated January 31, 1956

²⁸ Copco letter May 18, 1953.

²⁹ Protest of Klamath Irrigation District to Hydroelectric commission.

drainage pumping, including pumping from wells,” for those power users in the Klamath Reclamation Project.³⁰

Unlike most Reclamation Projects, the Klamath Project is essentially a drainage project, not a large water storage project. Lands were developed for irrigation by draining Lower Klamath Lake and Tulelake.³¹ To accommodate this, Reclamation developed Clearlake and the Lost River Diversion Channel to reduce flows to Tulelake to allow evaporation of the lake and development of the lakebed as irrigated agricultural lands.

In 1910, Clear Lake Dam was completed. Also in 1910, contracts were let for construction of Lost River Diversion Channel and Lost River Diversion Dam (also known as Horseshoe Dam and Wilson Dam).³²

In 1911, construction began on the Lost River Diversion Channel and Lost River Diversion Dam. In 1912, the Lost River Diversion Dam and the Lost River Diversion Channel were completed.³³ The Lost River Dam was constructed upstream of Tule Lake to divert Lost River water to the Klamath River and prevent as much water as possible from entering the Lake.³⁴ The Lost River Diversion Channel was constructed along the same course as the Lost River Slough to control the flows of the Klamath River into Tule Lake and the flow of Lost River into either Tule Lake or the Klamath River.³⁵ Also in 1912, the Klamath Straits between Klamath River and the Lower Klamath area was closed.³⁶ In 1914, gates were installed in the Klamath Straits at Ady.³⁷

In 1938, a report was released by Reclamation on the development of the Modoc Unit, identifying facilities affecting Tule Lake Sump and lands within the Tule Lake and Lower Klamath National Wildlife Refuges.³⁸ The plan identified, among other things, construction of a pump (Pumping Plant D) on the west side of the sump and a tunnel (Tule Lake tunnel) through Sheepy Ridge, with water pumped from the Sump through the tunnel to P-Canal and the Lower Klamath area. These facilities would provide improved flood control at the Sump and assist in maintenance of water levels in the Sump. In addition, the pumped water would provide a source to users on the P-Canal, ameliorate dust problems that existed on areas of the current Lower Klamath Refuge, and provide waterfowl benefits on that area. The Modoc Unit, which later came to be included in the Tule Lake Division, was then undertaken. Id.

³⁰Letter from Secretary of Interior Douglas McKay to Klamath River compact commission, dated October 26, 1953; Letter from Klamath River Compact Commission to Secretary of the Interior, Dated December 17, 1954.

³¹Cessions Act, 33 Stat. 174, Dated February 9, 1905

³²Klamath Project History, 1903-1912.

³³Klamath Project History, 1903-1912, p.172.

³⁴Direct Testimony of Dr. Timothy D. Mayer, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00015001, p. 19

³⁵Klamath Project History, 1903-1912, p. 97.

³⁶Klamath Project History, 1903-1912; p. 166

³⁷Klamath Project History, 1914; p. 3

³⁸Supplemental Estimates-Department of the Interior, 76 Congr., 3d Sess., Document No. 169, March 21, 1940.

In 1940, construction was begun on Pumping Plant D and the Tule Lake tunnel. Also, in 1940, Reclamation and the Service (Biological Survey at the time) entered an agreement concerning the Modoc Unit and management of the Refuges.³⁹

In 1942, Reclamation and the Service entered an agreement concerning wildlife operations within the Klamath Project pursuant to the Modoc Unit development.⁴⁰ In 1940 and 1943, the Secretary, on behalf of the Service, and Klamath Drainage District (KDD) entered agreements for, among other things, enlargement of the Ady Canal and service by KDD to California Lower Klamath lands within the Refuge.⁴¹ In 1941, Tule Lake tunnel was completed. Also, the P-Canal was completed.⁴² In 1942, Pumping Plant D was completed and placed into operation.⁴³

Clearlake was developed as an evaporation sump to reduce annual flows in the Lost River to Tulelake, and the Lost River Diversion Channel was developed to divert flood flows and excess irrigation flood flows from the Lost River to the Klamath River to reduce flooding in Tulelake.⁴⁴

The construction of the Straits Drain allowed development in the Lower Klamath Lake area. When the railroad laid their track into Klamath Falls, they had to build a berm over the marsh lands between Lower Klamath Lake and the Klamath River.⁴⁵ To allow water to exit the area, the Klamath Straits was developed into a drain with two pumping stations to lift the water from the lower portions of Lower Klamath Lake to the level of the Klamath River as it flows through Lake Euwana. The Straits Drain delivers accumulated agricultural drainage and flood waters to the Klamath River, allowing irrigated agriculture in the Lower Klamath Lake area, as well as maintaining operational levels in the Lower Klamath Lake National Wildlife Refuge.

Another feature provides additional water to the Klamath River from the Project. The D Pumping Plant pumps the water accumulated in the Tulelake sumps through Sheepy Ridge to the P Canal system where it is carried to and through the Lower Klamath National Wildlife Refuge to the Straits Drain, and eventually back to the Klamath River. The water that accumulates in the sumps is the side flow from the Lost River basin below the Lost River Diversion Dam in the winter, and drainage return flows from the Klamath Reclamation Project in the irrigation season.

These drainage features developed by the Klamath Reclamation Project have increased the water available to the Hydroelectric Project by a substantial quantity. Coupled with the additional storage provided by Link River, Gerber and Clearlake dams, control and

³⁹ Agreement between Bureau of Reclamation and Bureau of Biological Survey, dated January 14, 1940

⁴⁰ Agreement between Bureau of Reclamation and Fish and Wildlife Service, dated January 8, 1942

⁴¹ Contracts between Bureau of Reclamation and Klamath Drainage District, dated May 25, 1940 and April 28, 1943

⁴² Direct Testimony of Cecil Lesley, Klamath Water Rights Adjudication, EXHIBIT NO. 003E00010015, p. 53-62, February 23, 2004

⁴³ Klamath Project History, 1942; pp. 15-16

⁴⁴ Letter from D. C. Henry to Oregon State Engineer, Dated May 1, 1908

⁴⁵ Agreement between United States and railroads, dated October 24, 1907

firm water supply are provided to the Hydroelectric Project that would not be available without the Reclamation Project.

Integral to the operation of Project facilities and the delivery of water to Project lands is the use of return flows.⁴⁶ Both the Klamath Irrigation District (KID) and Tulelake Irrigation District (TID) systems rely on these return flows in their operation and delivery of water.⁴⁷ Most of the water that is in Tule Lake during the irrigation season is return flow (estimated as over 90%).⁴⁸ In addition, to ensure that this water remains available to all lands within the Project, the United States retains control of this return flow through contract.⁴⁹

Water from the Klamath River in the reach between Link River and Keno Dam is diverted for direct use on the irrigated lands.⁵⁰ These diversions include Modoc Lumber Co, Pioneer District Improvement Company, Ady District Improvement Company, Reames Golf & Country Club, Inc., Don Johnson & Son, Plevna District Improvement Company, Collins Products, LLC, and other Project water users.

Klamath River Basin Compact

The Klamath River Basin Compact (Compact) was negotiated and entered into between the states of California and Oregon and consented to by an act of Congress. Negotiation of the Compact between states of Oregon and California was granted by Congress by the Act of August 9, 1955, 69 Stat. 613. Congress consented to the Compact itself by the Act of August 30, 1957, Public Law 85-222, 71 Stat. 497. The consent of congress to negotiate the Compact was given as follows:

The consent of the Congress is hereby given to the States of Oregon and California to negotiate and enter into a compact, providing for an equitable apportionment between the said States of the waters of the Klamath River and its tributaries, including Lost River which is not naturally tributary to the Klamath River but which is an interstate stream. within the Klamath Basin constructed by the Bureau of Reclamation, United States Department of the Interior, and for matters incidental thereto, upon the condition that one qualified person, not a resident of either Oregon or California, who shall be appointed by the President of the Unites States, and shall participate in said negotiations as a representative of the United States and shall make a report to the President and the Congress of the proceedings and of any compact so negotiated. Said compact shall not be binding or obligatory upon any of the parties thereto unless and until the same shall have been ratified by the legislature of each of the States aforesaid and consented to by the Congress of the United States.

⁴⁶ Oregon PUC, UE-170, TP pp.163-199 (cross examination of Cecil Lesley, April 7th, A.M.)

⁴⁷ Oregon PUC, UE-170, TP 2047, 2061-2062 (Danosky April 20th P.M.), 2531-2533 (cross examination of David Solem, April 22 A.M.).

⁴⁸ Oregon PUC, UE-170, TP, pp.1690-1691, 1710 (cross examination of Dr. Timothy D. Mayer, April 19th, A.M.)

⁴⁹ Oregon PUC, UE-170, TP pp.190, 199 (cross examination of Cecil Lesley, April 7th, A.M.)

⁵⁰ Points of Diversion Tables.

Act of August 9, 1955, ch. 676, 69 Stat. 613.⁵¹

As provided in Article III A, the Compact recognizes and protects the water rights of the entire Klamath Project. Article III A states in full as follows:

There are hereby recognized vested rights to the use of waters originating in the Upper Klamath River Basin validly established and subsisting as of the effective date of this Compact under the laws of the State in which the use or diversion is made, including rights to the use of waters for domestic and irrigation uses within the Klamath Project. There are also hereby recognized rights to the use of all waters reasonably required for domestic and irrigation uses which may hereafter be made within the Klamath Project.

Klamath River Basin Compact, Article III, A, Pub. L. 85-222, 71 Stat. 497, Section 1 (1957).

The area covered by the Compact includes the "Upper Klamath River Basin" which includes the drainage area of the Klamath River as well as the closed basin of the Lost River Valley. Compact Article II B. The Compact also recognizes that water diverted for use within the Project is derived from sources within both Oregon and California and that waters originating in both states are used to irrigate lands in both states. Compact Article III. The Compact also defines the Klamath Project consistent with the place of use claimed by the United States in Claim nos. 293-299 and 312 and 317. Compact Article II D. The Compact is binding on Oregon and California by virtue of their ratification of the Compact and the consent of the Compact by the Congress. El Paso County Water Improvement District No. 1 v. City of El Paso, 133 F.Supp. 894, 907 (1955) (citing Hinderlider v. La Plata River & Cherry Creek Ditch Co., 304 U.S. 92, 58 S.Ct. 803, 82 L.Ed. 1202 (1937)).⁵² A compact is a contract that must be construed and applied in accordance with its terms.⁵³ West Virginia ex rel. Dyer v. Sims, 341 U.S. 22, 28 (1958).

⁵¹ The Compact was approved by the Klamath River Commissions of the States of Oregon and California on November 17, 1956, at Klamath Falls, Oregon and ratified by the state of Oregon by chapter 142, section 1 (ORS 542.610), 1957 and by the state of California by ch. 113, 1957.

⁵² Once congressional consent is given, a compact is transferred into a law of the United States and the courts have no power to alter the apportionment chosen by Congress. Texas v. New Mexico, 462 U.S. 554, 564 (1983); Compact Clause of the Constitution, Art. III § 2 cl.2. The bearing of the Compact on any water rights considered by the Compact is a federal question. See City of El Paso, *supra* at 910.

⁵³ The Compact in Article XII - General Provisions provides that:
Nothing in this Compact shall be construed to limit or prevent either State from instituting or maintaining any action or proceeding, legal or equitable, in any court of competent jurisdiction for the protection of any right under this Compact or the enforcement of any of its provisions.

Article IV of the Klamath River Basin Compact (Compact) directs Oregon (and California) to “provide for the ... lowest power rates which may be reasonable for irrigation and drainage pumping, including pumping from wells” from the use of water from the Klamath River Basin. Act of August 30, 1957, Pub. Law 85-222, 71 Stat. 497; ORS 542.620, Article IV- Hydroelectric Power. This directive sets apart the Klamath Basin irrigators from other irrigators in the Klamath Basin or elsewhere in PacifiCorp’s service area.

Article IV provides in full as follows:

It shall be the objective of each State, in the formulation and the execution and the granting of authority for the formulation and execution of plans for the distribution and use of the water of the Klamath River Basin, to provide for the most efficient use of the available power head and its economic integration with the distribution of water for other beneficial uses in order to secure the most economical distribution and use of water and the lowest power rates which may be reasonable for irrigation and drainage pumping, including pumping from wells.

In reviewing Article IV of the Compact, it is clear that the Compact identifies that power is to be made available for irrigation and drainage pumping at the cost of that service to the Klamath Project. The Compact speaks directly to the use of Klamath River water for the generation of power to provide the “lowest power rates which may be reasonable” through the use of the “available power head” from the waters of Klamath River.

This issue of the appropriate use of water in the Klamath Basin for the generation of power was discussed in 1954 by the Klamath Compact Commission in formulating the Compact. The Compact Commission viewed the use of water for irrigation and for power to be part of a comprehensive plan for development in the basin.⁵⁴ The Compact Commission noted that the decision regarding the development of hydroelectric power on the Klamath River between Keno and Copco Lake was a key consideration in formulating the Compact. *Id.* The Compact Commission requested the Secretary of the Interior to withhold approval of any contract with the power company until it could be “formulated as an integral part of the draft of an interstate compact.” *Id.*

The Bureau of Reclamation began the development of the Klamath Reclamation Project in 1905, at which time it made filings to secure all of the unappropriated water in the Upper Klamath River Basin for use within the Project for irrigation, power and other uses.⁵⁵ Reclamation was also given control of Upper Klamath Lake by the State of Oregon for use in developing the reclamation project. *Id.*; General Laws of Oregon, January 20, 1905. PacifiCorp’s predecessor, Copco, required the use of this water, including the water stored in Upper Klamath Lake, for its power development

⁵⁴ Letter from Klamath River Compact Commission to Secretary of the Interior, December 17, 1954.

⁵⁵ Notice, May 17, 1905; Water Right Filing, January 5, 1905; Letter from Herbert Newell to Klamath County Chamber of Commer, November 16, 1920.

projects.^{56, 57} It is this integration of the use of water for power and irrigation that was critical in the formation of Article IV of the Compact. This integration was critical because the development of power in the Basin was dependent on the established irrigation practices in the Upper Klamath Basin, including those within the Klamath Reclamation Project.

Water from the Upper Klamath River Basin, including the Klamath Reclamation Project, is necessary for PacifiCorp's power development downstream and the use of low rate power is necessary to the irrigation and drainage of those lands that use the irrigation water that provides the benefits to PacifiCorp's power development.⁵⁸ The language of the Compact provides a reasonable basis for establishing Klamath Project cost based power rates for irrigation and pumping associated with the Klamath Reclamation Project.

Reclamation's Management Direction for "reserved" lands

Reclamation manages its federal lands in accordance with a variety of statutory mandates which include but are not limited to: the Reclamation Act; Endangered Species Act; Fish and Wildlife Coordination Act; National Environmental Policy Act; Flood Control Act; Federal Land Policy and Management Act; National Historic Preservation Act; Native American Graves Protection and Repatriation Act; Federal Water Project Recreation Act; and the Minerals Management Act. A more comprehensive list of statutory control of Reclamation land can be found in the attached policy documents.

Reclamation implements its statutory mandates through a variety of planning and policy guidance documents, including but not limited to: Floodplain Management Policy, Hazardous Waste and Materials Management Policy, Pest Management Policy, National Environmental Policy Act Policy, Reclamation Consultation Under the Endangered Species Act Policy, Emergency Management Policy, Decisions Related to Dam Safety Issues Policy, Hydroelectric Power Policy, Cultural Resources Management Policy, Wetlands Mitigation and Enhancement Policy, Recreation Management Policy,

⁵⁶ Letter from Copco to Klamath County Chamber of Commerce, November 15, 1920; Opinion and Order, Public Utilities Commission of the State of California, March 27, 1956; See Supplemental Opinion and Order Amending Order Issuing License, In the Matter of the California Oregon Power Company, Project No. 2082, 15 FPC 14, February 28, 1956.

⁵⁷ In the Federal Power Act license proceeding for PacifiCorp's hydroelectric project, the Federal Power Commission (now FERC) also found that the construction and operation of Project No. 2082 was not economically feasible without the use of the water stored behind Link Dam and the regulation of the dam as provided in the Link Dam agreement (1956 contract). The Commission confirmed these findings in a later order stating that "[t]he evidence in this case shows that the Big Bend development [now J.C. Boyle] and all of the existing and proposed developments rely for their operations on water releases from Link River Dam, a Government dam located upstream from all the developments. Such water releases are made pursuant to an agreement between the United States and Copco for a fifty-year term terminating in the year 2006 which corresponds with the term of the license for Project No. 2082." Order Adopting Initial Decision of Presiding Examiner, The California Oregon Power Company, Project No. 2082, 23 FPC 59, 4-5 (January 13, 1960).

⁵⁸ See 23 FPC 59 (presiding examiners decision for Project No. 2082, January 13, 1960); Letter from Copco to Reclamation, May 18, 1953; Letter from Copco to Klamath County Chamber of Commerce, November 15, 1920; Federal Power Commission, Decision of Presiding Examiner, Project No. 2082, October 2, 1953, p.14-17.

Occupational Safety and Health Program Policy, and Use of Excess Capacity in Reclamation Projects for the Impoundment, Storage and Carriage of Non-Project Water Policy. A comprehensive list of Reclamation Policies as well as Directives and Standards for implementation of those policies can be found at: [HTTP://www.usbr.gov/recman/](http://www.usbr.gov/recman/).

Reclamation's Preliminary 4(e) Conditions:

1. The Licensee shall enter into new or amended contract with Reclamation for the operation and maintenance of Link River and Keno Dams under terms and conditions satisfactory to the Secretary of the Interior. Such terms shall be substantially similar to the terms of the current contract and shall specifically include the following terms necessary for the protection of Klamath Reclamation Project operations:
 - A. The Licensee shall continue to operate and maintain Link River Dam. Such operation shall be consistent with the Klamath Reclamation Project Annual Project Operations Plans.

Justification:

PacifiCorp has operated and maintained Link River Dam under contract with the United States since 1917. During that time, the operation and management of Link River Dam has been critical to PacifiCorp's power generation for Project No. 2082. According to Reclamation's calculations this has not changed. Project No. 2082 continues to rely and will continue to rely during any new license period on the use and control of storage in Upper Klamath Lake. Such storage is vital to the purposes of the Klamath Reclamation Project as well as to Project No. 2082. Since PacifiCorp has in place the necessary infrastructure and expertise to continue to operate and maintain Link River Dam and because such operation is essential to its power generation, PacifiCorp shall continue to operate and maintain Link River Dam under contract with the United States during any new license period.

Additionally, because Reclamation is mandated to meet its obligations under the Endangered Species Act and Tribal Trust, in addition to delivering Klamath Project water under contract, PacifiCorp shall operate Link River Dam consistent with the Klamath Project Annual Operations Plans. This is necessary to allow Reclamation to adequately protect its resources as required by the statutes and policies listed above, and fulfill its responsibilities under the ESA and within its contractual obligations. Reclamation must work closely with PacifiCorp to manage Link River Dam in conjunction with the facilities in Project 2082. This is necessary to provide an appropriate water level in Upper Klamath Lake to protect the endangered suckers, and allow for full water deliveries at A Canal; control necessary to maintain Lake Ewauna at an elevation appropriate to provide the necessary head to make deliveries in the Lost River Diversion Channel and North

and Ady Canals; and to provide the required flows at Iron Gate Dam to meet Reclamation's responsibilities under its Biological Opinion from NOAA Fisheries.

B. For the period of the contract the Licensee would agree to furnish electric power for the purposes of pumping Klamath Water for use on Project Land and for drainage of Project Land at rates no higher than the cost of service from Project 2082.

Justification:

It is also necessary for the adequate protection and utilization of the Klamath Reclamation Project to maintain Klamath Project cost-based rates in the basin to provide pumping of return water from the irrigation project to the Klamath River for downstream uses and power generation by PacifiCorp. These cost-based rates allow Reclamation to return a substantial quantity of water to the Klamath River for use by PacifiCorp for power production below Keno (see attached spreadsheets on Reclamation return flows from Lost River Diversion Channel, D Plant, and Pumping Plants F and FF). Reclamation provides an average of over 200,000 acre-feet annually in returns to the Klamath River from Project facilities.

The Reclamation Project provides a positive effect for the Hydroelectric Project. Storage in Reclamation facilities allow for increased flows in the river during the late summer months when there would otherwise be limited ability to produce electricity (the river sometimes went dry below the current Link River Dam before the project.) Klamath Reclamation Project storage also provides flood control which reduces power outages due to high flow conditions in the winter months. Both of these periods of positive effect from storage are prime periods for power sales, due to high demand in the winter for heating and in the summer for air conditioning.

At least as important is the increased water availability from the Reclamation Project Drainage facilities. The Lost River Diversion Channel provides an average of 165,200 acre-feet annually to the Klamath River to augment power production, the Straits Drain provides an average of 106,630 acre-feet annually. An average annual increase of water available to the Hydroelectric Project of over 270,000 acre-feet, almost 23 percent of the flow that passes Keno; See attached Tables 1, 2, and 3 (KSD @ Pump F and FF; D Plant; Total Flow-Lost River Diversion Channel).

The additional water made available from the Reclamation Project, especially from the Straits Drain, depends on pumping to provide the ultimate benefit to the Hydroelectric Project. The pumps that develop this benefit are those large federally owned pumping plants that ultimately push the accumulated water from the sumps through the Straits Drain to the Klamath River, drainage pumps that are federally owned and operated by irrigation districts under contract, drainage

pumps that area owned and operated by irrigation districts, and drainage pumps owned and operated by individual irrigators. Without this integrated system, there would be a substantial reduction in water available for power production.

C. The Licensee shall, at its own expense, maintain the approach channel to the “A” Canal of the Klamath Reclamation Project to the satisfaction of Reclamation so far as may be necessary to carry a flow of not less than 1200 cfs into the “A” Canal with the water of Upper Klamath Lake at an elevation of 4137 (USBR datum).

Justification:

As part of PacifiCorp’s operation and maintenance of Link River Dam as described in 1. A. above, PacifiCorp must ensure that the primary diversion facility for the Klamath Reclamation Project is not affected by PacifiCorp’s operation for power generation. The intake for the “A” Canal is just upstream from Link River Dam and the operations of Link River Dam can affect diversions to the “A” Canal if not properly monitored and maintained. Any adverse affect to the “A” Canal approach channel will likewise adversely affect the ability of Reclamation to deliver water to the lands within the Reclamation Project.

D. The Licensee shall assume any and all liability for damages resulting from operation of the Link River Dam by the Licensee or resulting from its regulation and control of the water levels of Upper Klamath Lake. The Licensee would undertake to hold the United States harmless from any and all liability for damage arising out of the operation by the Licensee of Link River Dam and the regulation and control by the Licensee of Upper Klamath Lake provided for in the contract.

Justification:

PacifiCorp would be operating and maintaining Link River Dam primarily for the benefit of power generation so should assume all liability related to that operation.

E. Nothing in the contract shall curtail or in anywise be construed as curtailing the rights of the United States to Klamath Water or to the lands along or under the margin of Upper Klamath Lake. No Klamath water shall be used by PacifiCorp when it may be needed or required by the United States or any irrigation or drainage district, person, or association obtaining water from the United States for use for domestic, municipal, and irrigation purposes on Project Land.

Justification:

Reclamation holds water rights for the Klamath Reclamation Project that are senior to the water rights for PacifiCorp’s Project No. 2082 except for a 205 cfs

water right of PacifiCorp's for power generation from Link River. Further, as explained above, Reclamation has by statute the right to store water in Upper Klamath Lake for Reclamation Project purposes and any operation by PacifiCorp shall not interfere with that right to the extent that right is exercised for the benefit of the Klamath Project.

F. PacifiCorp shall operate Keno Dam so that the upstream water level will not be below the minimum normal objective operating height of elevation 4085.0 (USBR Datum), at or near the location of the present Highway No. 66 bridge at Keno, Oregon.

Justification:

This specific control is necessary to maintain Lake Ewauna at an elevation appropriate to provide the necessary head to make deliveries in the Lost River Diversion Channel and North and Ady Canals which are essential to the proper operation of the Klamath Project for both agricultural lands and lands within the National Wildlife Refuges.

G. PacifiCorp shall operate Keno Dam to accommodate the discharge of three thousand (3,000) cubic feet per second from the Lost River Diversion Channel, and six hundred (600) cubic feet per second from the Klamath Straits Drain.

Justification:

This requirement is to facilitate the flood control operation of the Klamath Project which is essential to the proper operation and management of the Project to meet its obligations.

2. The Licensee, in consultation with Reclamation, shall develop operating criteria that provides for coordination with the operations of Link River Dam and Iron Gate Dam, or the most downstream dam within Project No. 2082 to allow Reclamation to meet its responsibilities.

Justification:

Reclamation's responsibilities under the ESA as well as its responsibilities for Tribal Trust require that measured flows be provided into the Lower Klamath River (currently below Iron Gate), while specific water levels are maintained in Upper Klamath Lake. To adequately protect its resources, Reclamation must work in coordination with PacifiCorp to meet these requirements on a sustained basis. Coordinated operations should also minimize and mitigate impacts to salmonids and suckers from low flows and flow fluctuations caused by Project operations at Eastside and Westside facilities. Without coordinated operations, flow variations could have a deleterious effect on threatened species, or other resources valuable to downstream and upstream tribes. Ramping rates and flow

variations that are currently under the control of PacifiCorp could cause stranding, or crowding of fish that could lead to disease, or death if these facilities are not operated in a coordinated manner to fulfill the responsibilities and needs of all parties. Further, if these operations are not coordinated for the purposes stated above, the operations of the Klamath Reclamation Project would be adversely affected. This could result in curtailment of irrigation deliveries or deliveries of water to the National Wildlife Refuges. This is so, because operational adjustments that Reclamation must make in Klamath Reclamation Project operations independent of PacifiCorp operations to meet ESA or tribal trust resource obligations that it would not otherwise have to make if the Reclamation Project operations were properly coordinated with the Project's operations could result in additional water releases to the Klamath River or water remaining in Upper Klamath Lake that otherwise would be diverted for Reclamation Project purposes.

3. The Licensee, in consultation with Reclamation, shall develop operating criteria that provides for coordination with the operations of Keno Dam and Iron Gate Dam, or the most downstream dam within Project No. 2082, as in Attachment 2.

Justification:

In addition to the justification in 2 above, management of operations at Keno is critical to delivery of water to Project lands along Link River to Keno reach, in the Lower Klamath Lake area and to the Lower Klamath Lake Wildlife Refuge. Approximately 41 percent of the lands irrigated by the Klamath Irrigation Project and the Lower Klamath Lake National Wildlife Refuge receive their water directly or indirectly by gravity flow from the Link River to Keno reach. Coordination of these operations to meet the criteria listed in the attachment are necessary to meet minimum elevations for charging North and Ady Canals to meet demands throughout the year, as these facilities are operated year round. In addition, coordinated operations should minimize impacts to salmonids and suckers from low flows and fluctuations by Project operations at Keno Dam.

4. The Licensee shall provide Reclamation with area capacity curves for all facilities within Project No. 2082, and will provide Reclamation with real time access to reservoir elevations and releases for facilities within Project No. 2082.

Justification:

This information is necessary to allow Reclamation to adequately protect and utilize its facilities in light of the FERC-licensed operations of PacifiCorp's Project No. 2082. Without the area capacity curves and real time operational data, Reclamation would have no usable information to plan for releases from the Lost River Diversion or from the Straits Drain to coordinate efforts and manage the limited resources of the basin in the best manner possible. It is impossible at this time to determine the source of water that PacifiCorp uses to refill its facilities when it has made deliveries downstream that may be required under re-licensing or reduced storage for maintenance of facilities requiring refill. With

this information, Reclamation will be able to determine if the water used for refill and generation is indeed PacifiCorp's water or Reclamation's Project water.

5. Any operations or modifications to Project No. 2082 that could affect the federal Klamath Reclamation Project are prohibited unless approved by Reclamation.

Justification:

Changes in operations or modifications to Project No. 2082 could impact Reclamations ability to meet its contractual responsibilities within the Reclamation Project, as well as its ESA and Tribal Trust responsibilities downstream.

6. The licensee shall have no claim against the United States arising from the effect of any changes in releases from, operations of, or elevation changes in Upper Klamath Lake or Lake Ewauna related to the federal Klamath Project operations or use of water for the Upper Klamath, Lower Klamath or Tule Lake National Wildlife Refuges.

Justification:

PacifiCorp's Project No. 2082 has limited water rights, and is a subsequent user of surplus water from the Klamath Reclamation Project. Reclamation has no responsibility for delivery of water to Project No. 2082 beyond those limited water rights that are senior to Reclamation's water rights. Any operation of the Klamath Project is senior to operations of Project No. 2082, and has precedence over its operations.

7. Authority is reserved to the Commission to require the Licensee to implement such conditions for the protection and utilization of Reclamation reservations as may be provided by the Secretary of the Interior, pursuant to Section 4(e) of the Federal Power Act, 16 U.S.C. § 797(e).

Justification:

This general reservation of authority allows the Secretary to consider additional data as it becomes available, to respond to changed circumstances, and modify the existing section 4(e) conditions as may be necessary. The Secretary's reservation of mandatory authorities under the FPA has been accepted by the Commission and judicially affirmed. *Wisconsin Public Services Corp.*, 62 FERC ¶ 61,905 (1993), *aff'd*, *Wisconsin Public Serv. Corp. v. FERC*, 32 F.3d 1165 (7th Cir. 1994).

The Klamath Tribes of Oregon hold treaty-protected property rights, including fishing and water rights, in the upper Klamath Basin. The United States and the Klamath Tribes have jointly filed claims in the State of Oregon's water rights adjudication for the surface waters of the Klamath Basin in Oregon, including instream flow claims within the Project area (from Link River Dam to the Oregon-California border), to protect the Tribes' fishing and water rights reserved

to them pursuant to their 1864 Treaty with the United States. In addition, the Hoopa Valley and Yurok Tribes have confirmed reserved fishing rights in the lower Klamath Basin, and the water necessary to protect those rights may likewise be determined in a subsequent proceeding.

Any condition or prescription required for this Project's license, including those to protect federal interests, must be consistent with these reserved rights. Additional data or other information, including a binding decree resulting from the State of Oregon's water rights adjudication, may require modification to the license conditions. Thus, the Department is submitting these reservations of authority. The Department's other recommendations do not ask FERC to take any action or otherwise engage in the issues being addressed in the water rights adjudication.

Table 1. KSD @ Pump F and FF (TAF/Mo)

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
1961	7.78	12.62	13.82	8.24	16.48	14.73	7.69	17.8	6.73	2.59	2.52	1.49	112.49
1962	3.84	14.01	15	1.67	7.96	18.26	12.45	4.09	2.77	3.5	4.37	1.94	89.86
1963	10.99	18.41	18.97	12.44	14.15	18.82	9.28	6.95	1.59	1.5	2.32	1.36	116.78
1964	7.03	17.56	7.24	8.06	13.99	18.39	6.42	4.55	10.59	4.21	3.88	3.33	105.25
1965	0.91	12.64	8.39	17.34	16.23	18.8	18.77	17.3	10.14	13.6	15.31	8.1	157.53
1966	6.12	14.68	13.82	2	11.7	16.85	5.54	3.15	4.21	6.83	5.64	5.36	95.9
1967	1.45	8.14	15.65	15.22	12.01	17.39	7.28	17.96	4.34	2.89	4.5	6.55	113.38
1968	7.2	8.8	6.13	9.1	13.08	45.35	3.34	2.7	4.42	4.85	7.73	9.45	122.15
1969	3.79	15.11	11.14	9.14	16.71	18.61	12.34	13.13	7.38	13	10.37	10.17	140.89
1970	15.19	11.03	11.69	18.84	17.09	18.63	10.3	17.18	10.58	13.88	4.73	9.01	158.15
1971	10.75	17.83	18.21	8.88	13.89	13.59	4.11	15.72	8.19	6.06	5.74	8.19	131.16
1972	11.94	17.71	15.44	10.44	17.17	18.66	9	11.28	4.18	5.49	7.61	10.97	139.89
1973	1.53	14.84	16.98	14.68	12.6	10.44	2.58	8.97	5.24	5.8	10.64	10.79	115.09
1974	4.6	2.92	18.94	18.26	15.13	17.71	7.64	8.95	5.18	7.42	10.66	7.89	125.3
1975	6.25	12.05	7.57	11.84	16.62	18.58	16.98	13.58	6.25	5.55	8.17	12.72	136.16
1976	7.79	8.45	13.92	17.19	11.29	12.26	2.97	3.88	6.71	6.3	14.61	14.75	120.12
1977	12.94	15.87	6.31	5.66	8.05	17.28	8.45	13.5	17.7	5.25	8.81	3.31	123.13
1978	4.22	3	8.12	12.09	13.31	12.66	12.08	4.89	3.54	6.11	7.28	0	87.3
1979	5.88	3.4	12.21	15.09	10.1	17.07	3.44	5.68	3.64	5.8	7.86	9.5	99.67
1980	4.37	11.24	16.27	13.78	16.81	22.65	6.34	6.15	6.9	7.5	4.83	10	126.84
1981	4.88	8.9	5.89	10.02	10.77	10.15	4.31	6.58	4.59	4.99	3.58	3.7	78.36
1982	4.07	9.75	15.76	20.09	23.61	27.76	7.4	3.91	6.66	11.91	7.11	7.72	145.75
1983	4.87	10.32	6.29	7.45	24.68	25.95	9.26	7.58	7.24	8.94	9.87	9.99	132.44
1984	6.3	11.49	20.47	23.49	30.03	23.43	6.91	5.9	8.86	5.73	4.74	12.98	160.33
1985	6.66	15.76	12.82	3.71	4.57	20.67	7	6.22	8.41	4.51	11.02	8.51	109.86
1986	5.03	6.04	6.87	10.88	18.4	27.96	9.57	11.85	7.13	5.92	9	7.44	126.09
1987	3.15	9.29	4.55	8.93	11.93	15.75	6.76	5.52	7.52	8.22	11.81	7.39	100.82
1988	2.72	2.94	8.55	6.19	11.78	18.65	12.01	9.6	9.39	4.95	8.03	5.39	100.2
1989	2.48	4.06	6.43	4.77	6.46	26.9	16.65	15.01	7.13	4.87	7.7	9.75	112.21
1990	4.48	7.81	3.74	7.27	6.12	19.41	10.7	8.9	11.81	6.4	7.92	8.23	102.79
1991	3.49	7.11	4.6	4.4	6.18	17.59	8.59	10.22	7.59	5.39	3.07	5.86	84.09
1992	0.28	0.35	0.69	0	0.32	2.41	0.74	1.2	0.13	0	0	0	6.12
1993	0.63	0.59	0.64	1.67	2.84	24.36	23.57	11.5	11	5.95	5.04	3.58	91.37
1994	1.81	1.36	2.04	4.68	10.17	8.28	8.29	10.42	5.98	5.3	3.37	1.38	63.08
1995	0.73	0.66	1	1.13	6.98	24.68	12.79	11.26	8.02	5.4	3.65	3.05	79.35
1996	1.17	1.69	4.52	20.46	27.39	23.06	10.49	13.56	8.61	6.02	5.08	3.14	125.19
1997	1.55	3.92	9.16	20.07	22.63	7.7	5.51	8.33	7.56	5.4	3.63	3.28	98.74
1998	2.5	5.44	7.63	11.29	17.88	11.91	18.66	18.18	13.14	5.16	4.73	3.47	119.99
1999	3.91	8.15	12.06	9.28	18.75	22	15.03	10.92	5.94	6.6	11.87	4.63	129.13
2000	2.26	1.52	3.22	4.67	10.14	11.52	6.75	14.45	8.38	7.6	4.91	5.09	80.52
2001	1	1.44	1.61	2.27	2.43	6.93	2.09	0.21	0	0	2.37	0.72	21.09
2002	0.1	0.34	0.98	4.27	9.13	13.13	7.09	8.15	6.96	6.19	12.2	6.6	75.15
2003	1.68	1.48	2.97	3.68	8.21	12.57	7.86	8.97	7.87	3.83	3.37	3.18	65.66
2004	1.89	1.5	1.67	2.05	12.6	13.68	6.44	6.11	8.49	4.04	3.91	4.15	66.53
Avg	4.6	8.23	9.09	9.61	13.14	17.8	8.9	9.36	7.02	5.94	6.72	6.23	106.63
Min	0.1	0.34	0.64	0	0.32	2.41	0.74	0.21	0	0	0	0	6.12
Max	15.19	18.41	20.47	23.49	30.03	45.35	23.57	18.18	17.7	13.88	15.31	14.75	160.33

Table 2. D Plant (TAF/Mo)

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
1962	7.99	15.37	16.04	0.31	7.99	5.88	0	6.82	1.03	2.42	6.08	0.54	70.47
1963	13.89	18.21	18.41	2.93	4.91	0	1.4	9.32	0.08	4.56	5.48	3.23	82.42
1964	9.55	15.4	11.52	1.63	0	3.36	0	5.84	11.67	2.09	6.82	3.9	71.78
1965	5.94	15.94	15.56	18.53	17.13	15.49	10.64	8.48	6.78	13.4	13.19	4.18	145.26
1966	8.22	14.76	12.78	0.94	4.3	0	0	5.16	3.69	7.07	7.76	6.83	71.51
1967	7.99	16.7	18.73	11.79	0	1.43	5.18	17.28	5.24	1.27	8.33	6.19	100.13
1968	12.97	13.06	10.66	3.05	0	3.61	3.18	7.29	6.16	3.49	12.08	11.12	86.67
1969	8.8	16.39	15.1	9.95	13.23	2.99	1.71	8.77	5.28	9.16	7.8	9.91	109.09
1970	16.14	15.97	15.11	11.54	11.15	6.8	0	15.14	6.86	13.38	5.29	7.7	125.08
1971	11.98	16.36	16.42	2.69	0.42	6.13	2.09	15.6	11.88	6.05	4.49	8.51	102.62
1972	13.6	15.86	10.6	4.84	9.41	11	0.73	11.1	1.63	2.1	8.25	11.72	100.84
1973	13.35	16.58	7.69	0	0.42	1.23	2.71	9.11	2.13	2.91	7.59	11.23	74.95
1974	8.92	13.62	17.08	7.19	1.08	0	2.06	10.58	2.08	5.57	10.3	6.75	85.23
1975	8.76	14.85	11.94	0	5.4	8.2	2.71	8.34	2.91	7.91	6.86	14.1	91.98
1976	10.87	15.23	9.73	1.04	0.8	0	0	2.84	7.14	2.55	17.34	16.77	84.31
1977	16.54	16.08	4.02	0	1.25	0.29	1.82	14.99	6.72	1.27	5.86	7.62	76.46
1978	12.66	4.47	11.49	15.86	5.11	0	8.05	5.13	3.44	3.68	7.7	12.15	89.74
1979	7.24	13.24	9.99	0	0.63	0	4.88	5.86	7.71	7.92	7.26	12.45	77.18
1980	10.69	15.83	17	12.73	8.32	4.62	0	8.26	7.17	5.02	4.97	10.31	104.92
1981	13.76	15.04	5.71	0	0	0	1.01	7.92	6.77	4.18	5.02	8.72	68.13
1982	12.48	14.79	15	15.12	10.64	7.76	0	4.82	6.92	12.25	8.22	12.11	120.11
1983	11.35	14.92	10.22	2	13.02	10.98	0	7.72	7.02	11.64	11.86	10.79	111.52
1984	11.47	13.12	16.47	16.82	9.11	3.33	0	7.05	11.18	7.98	8.19	15.64	120.36
1985	13.63	16.3	12.7	3.73	1.89	1.59	1	8.13	10.56	3.81	13.28	16.66	103.28
1986	12.97	16.84	6.69	0	5.84	10.24	0.62	13.1	6.56	7.89	9.66	14.14	104.55
1987	13.1	16.6	5.99	0	0	0	1.52	9.5	8.01	10.3	17.79	14.08	96.89
1988	9.71	16.26	10.86	0	1.98	1.6	3.81	12.41	11.01	5.91	9.47	10.78	93.8
1989	11.96	16.49	8.47	0	0	11.63	4.09	12.13	5.56	4.28	9.85	15.46	99.92
1990	12.96	17.01	6.51	0.07	0.96	3.68	2.03	10.14	11.54	6.24	11.43	14.28	96.85
1991	13.46	16.13	6.06	0	0	0	0	11.02	5.47	4.9	6.3	11.56	74.9
1992	8.65	15.77	8.85	0	0	0	0	0	0	0.25	0	8.1	41.62
1993	5.79	8.58	5.37	4.36	2.77	14.75	6.68	8.11	10.36	5.27	7.59	9.15	88.78
1994	13.55	9.34	4.03	0.04	0	0	0.49	13.26	4.26	0.66	0.99	2.83	49.45
1995	2.1	12.5	0	7.95	3.66	14.38	7.47	10.63	9.4	4.35	4.36	9.33	86.13
1996	8.23	11.99	5.14	12.08	17.03	12.51	7.88	15.67	4.51	6.56	4.68	9.08	115.35
1997	9.22	13	3.96	15.17	10.03	0	2.42	7.02	7.89	5.73	4.91	10.52	89.87
1998	10.4	11	4.76	6.03	6.94	0.43	10.38	16.28	12.36	5.19	4.84	8.53	97.14
1999	12.95	12.83	11.62	2.87	7.94	9.36	5.07	11.11	7.98	4.46	11.18	12.23	109.58
2000	9.57	12.24	1.93	6.48	1.65	1.43	5.63	12.23	5.84	7.65	5.41	9.22	79.27
2001	11.02	7.17	0.58	0	0	0	0	0	0	0	0	5.07	23.84
2002	9.72	7.19	6.76	7.73	3.72	2.98	1.18	9.76	4.6	3.68	9.31	10.66	77.29
2003	7.84	3.76	2.56	3.5	3.91	1.93	11.48	10.32	1.49	0.13	8.06	6.49	61.47
2004	4.93	4.05	3.28	4.03	5.34	1.98	1.24	9.26	1.97	3.57	2.62	9.04	51.33
2005	11.81	9.75	4.02	4.7	1.33	0	1.61	13.62	3.65	0.37	4.96	9.27	65.09
Average	10.76	13.88	9.76	4.98	4.59	4.28	2.86	9.39	6.16	5.36	7.76	9.78	89.54
Minimum	2.1	3.76	0	0	0	0	0	0	0	0	0	0.54	23.84
Maximum	16.54	18.21	18.73	18.53	17.13	15.49	11.48	17.28	12.36	13.4	17.79	16.77	145.26

Table 3. Total Flow -- Lost River Diversion Channel (TAF/Mo)

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
1961	9.35	7.69	11.88	8.3	12.72	11.13	7.09	11.02	10.24	10.16	10.82	11.13	121.53
1962	9.94	8.17	12.32	8.45	22.11	16.45	10.3	12.12	3.8	8.33	11.69	10.07	133.75
1963	40.03	10.35	15.97	8.13	20.94	7.86	13.95	11.23	9.04	9.69	10.24	13.21	170.64
1964	10.95	9.47	8.04	10.05	8.08	20.67	16.11	10.66	13.82	7.29	15.44	12.58	143.16
1965	11.83	8.42	50.94	69.97	45.17	14.67	11.12	14.28	17.22	13.27	16.48	13.97	287.34
1966	11.89	8.25	8.52	12.43	8.43	17.03	7.53	9.96	12.37	12.78	14.52	13.58	137.29
1967	10.66	8.37	17	14.8	14.02	20.6	15.18	12.47	10.14	9.19	13.75	13.44	159.62
1968	12.92	6.69	7.19	9.68	13.56	7.99	5.27	12.88	9.48	13.27	18.01	13.27	130.21
1969	12.7	7.92	10.36	22.85	20.45	34.83	26.6	15.2	17.91	12.81	16.07	15.66	213.36
1970	14.91	8.51	21.17	59.6	30.63	23.76	13.31	16.88	15.4	11.17	13.47	16.21	245.02
1971	14.1	12.5	18.5	25.94	12.17	47.15	55.3	22.33	17.42	19.18	34.15	46.09	324.83
1972	20.28	9.8	11.2	31.03	28.62	82.29	14.84	16.76	18.32	20.02	22.07	23.5	298.73
1973	14.67	9.41	12.4	12.4	13.05	11.28	7.28	13.39	14.25	11.95	15.4	17.69	153.17
1974	12.67	14.24	19.64	19.25	10.87	29.37	41.54	19.03	10.78	14.81	15.7	16.83	224.73
1975	15.37	8.39	8.97	8.83	16.85	28.14	16.92	15.28	13.83	17.01	20.08	20.09	189.76
1976	16.5	10.22	10.15	9.92	9.9	13.84	7.15	13.8	15.51	13.39	19.46	17.88	157.72
1977	14.45	7.15	7.43	7.02	7.17	5.96	6.77	10.97	11.33	9.03	11.12	13.47	111.87
1978	10.49	8.27	21.47	23.23	12.11	19	21.46	12.44	12.74	13.17	14.98	16.9	186.26
1979	12.65	7.94	8.35	10.83	6.79	11.66	5.56	6.73	5.36	5.91	8.88	6.62	97.28
1980	9.55	10.08	10.7	24.89	20.38	11.34	6.3	7.1	8.71	5.06	8.27	11.15	133.53
1981	8.85	4.89	6.58	5.72	9.24	9.1	5.53	5.88	3.51	4.63	4.53	7.3	75.76
1982	8.9	16.09	33.19	10.15	53.43	19.05	53.85	9.23	10.76	11.21	11.62	15.11	252.59
1983	9.75	8.15	13.68	19.91	53.8	66.88	35.26	23.13	13.83	10.32	14.94	13.23	282.88
1984	14.57	10.25	53.77	37.88	17.73	27.82	30.4	17.34	15.3	9.09	18.34	29.46	281.95
1985	32.65	17.09	11.66	7.88	12.65	14.32	17.19	10.54	9.27	8.01	11.73	13.25	166.24
1986	9.71	6.03	6.72	10.7	37.44	41.9	9.45	11.34	7.19	8.17	11.44	15.16	175.25
1987	7.27	5.18	5.65	6.69	9.47	8.74	3.98	9.57	8.19	9.79	5.98	10.41	90.92
1988	8.01	4.48	5.55	8.41	13.08	8.81	5.8	6.58	6.36	3.06	5.43	8.98	84.55
1989	7.36	7.27	6.15	5.24	13.53	34.81	11.85	7.53	6.34	5.59	8.81	14.01	128.49
1990	9.46	4.9	5.11	11.91	7.22	13.59	5.17	8.81	5.76	4.4	8.22	8.25	92.8
1991	8.36	4.77	3.71	5.33	4.34	5.94	1.69	3.74	1.85	1.71	0.94	1.28	43.66
1992	4.75	2.88	2.89	2.99	2.74	2.41	0.5	0.83	0.75	0.68	0.5	0.87	22.79
1993	0.95	1.09	1.23	2.4	7.41	61.17	12	4.45	5.4	1.85	5.64	7.15	110.74
1994	7.72	3.82	5.22	4.76	4.03	4.18	0.97	2.8	2	0.72	0.61	0.99	37.82
1995	2.56	2.05	3.65	20.66	11.19	38.34	15.25	17.27	6.1	3.28	3.82	7.5	131.67
1996	8.79	3.96	12.3	14.06	81.71	38.94	17.95	14.36	4.7	2.58	3.81	9.58	212.76
1997	7.86	6.05	17.34	57.26	39	11.45	7.65	5.96	6.67	4.98	6.6	10.19	181.02
1998	8.6	5.98	6.38	27.44	19.91	45.57	67.38	79.84	31.83	6.87	6.81	13	319.61
1999	12.06	12.12	17.85	15.75	37.14	113.35	64.38	14.51	12.17	8.09	14.76	18.97	341.13
2000	15.38	7.86	8.36	20.21	18.06	20.94	11.07	12.33	9.4	9.29	9.17	42.08	184.14
2001	13.99	7.25	8.62	7.51	7.04	8.9	3.27	0	0	0	0	0.9	57.48
2002	0	0	8.27	23.12	11.44	9.16	5.91	9.78	6.97	5.93	8.91	11.8	101.28
2003	9.76	4.7	6.59	14.47	8.62	7	11.82	11.39	7.51	5.1	7.78	13.58	108.31
Average	11.7	7.64	12.62	17.16	18.94	24.36	16.46	12.83	9.99	8.44	11.19	13.87	165.2
Minimum	0	0	1.23	2.4	2.74	2.41	0.5	0	0	0	0	0.87	22.79
Maximum	40.03	17.09	53.77	69.97	81.71	113.35	67.38	79.84	31.83	20.02	34.15	46.09	341.13